AMENDMENT CLAIMS

Amendment Claims [Received by the International Bureau on March 9, 2004 (09.03.04): Claims 1 through 7, 11 through 15, 17 and 18 of the initial application were amended; the other Claims are unchanged. (Page 4)]

1. (Amended) A digital communication method, characterized in that a binary digital information signal is made into a multivalued ternary signal by means of binary-input/ternary-output error correction code conversion, and is encoded, the phase of a carrier wave is changed and subjected to three-phase modulation in response to the multivalued and encoded ternary signal, and the three-phase modulated signal is transmitted.

2. (Amended) A digital communication method, characterized in that information related to a ternary signal is detected from a binary-input/ternary-output error correction code by phase demodulating a three-phase modulated signal, and binary digital information is obtained by decoding the binary-input/ternary-output error correction code using information related to the ternary signal obtained by the phase demodulation.

3. (Amended) A digital communication device, characterized in comprising:

encoding means for multivaluing a binary digital information signal to obtain a ternary signal by means of

binary-input/ternary-output error correction code conversion, and encoding [the binary digital information signal]; and

three-phase modulating means for changing the phase of a carrier wave in response to a ternary signal outputted from the encoding means.

4. (Amended) A digital communication device, characterized in comprising:

phase demodulating means for detecting information related to a ternary signal from a binary-input/ternary-output error correction code by phase demodulating a three-phase modulated signal; and

decoding means for determining a binary digital information signal by decoding a binary-input/ternary-output error correction code using information related to a ternary signal outputted from the phase demodulating means.

5. (Amended) The digital communication device according to Claim 3, characterized in that said encoding means comprises:

delaying means for delaying a binary digital information signal; and

modulo 3 adding means for carrying out an operation over a Galois field GF(3) on a plurality of signals outputted from the delaying means.

6. (Amended) The digital communication device according to Claim 3, characterized in that said encoding means generates, from a binary digital information signal, an error

correction code prescribed over a Galois field GF(3), and said three-phase modulating means changes the phase of a carrier wave in response to a symbol of said error correction code symbol.

7. (Amended) The digital communication device according to Claim 3, characterized in that said three-phase modulating means comprises constant envelope modulated wave generating means for generating, in response to a ternary signal outputted from said encoding means, a constant envelope modulated wave having signal points, the phases of which differ relatively by 2p/3 each.

8. The digital communication device according to Claim 7, characterized in that said constant envelope modulated wave generating means generates, in response to two temporally consecutive symbols, constant envelope modulated waves, the carrier wave phases of which are either the same or differ relatively by 2p/3.

9. A constant envelope three-phase modulator, characterized in comprising:

means for delaying or storing a ternary signal;

response waveform storing means for outputting a quadrature component and an in-phase component corresponding to a transition locus of a carrier wave phase in accordance with patterns of a plurality of temporally consecutive ternary signals; and

means for orthogonally modulating a carrier wave using a quadrature component and an in-phase component outputted from the response waveform storing means.

10. The digital communication device according to Claim 7 or Claim 8, characterized in that said constant envelope modulated wave generating means is a constant envelope three-phase modulator which comprises:

means for delaying or storing a ternary signal;

response waveform storing means for outputting a quadrature component and an in-phase component corresponding to a transition locus of a carrier wave phase in accordance with patterns of a plurality of temporally consecutive ternary signals; and

means for orthogonally modulating a carrier wave using a quadrature component and an in-phase component outputted from the response waveform storing means.

11. (Amended) A binary-input/ternary-output error correction encoder, characterized in comprising:

an even number of delaying means for delaying an input signal of a binary digital information signal; and

modulo 3 adding means for carrying out an operation over a Galois field GF(3) on a signal outputted from the delaying means and an input signal,

the binary-input/ternary-output error correction encoder using at least the input signal and final delaying

means output signal in an operation over the Galois field GF (3).

12. (Amended) The digital communication device according to any of Claims 3, 5 or 6, characterized in that said encoding means is a binary-input/ternary-output error correction encoder, which comprises an even number of delaying means for delaying an input signal of a binary digital information signal, and means for carrying out an operation over a Galois field GF(3) on a signal outputted from the delaying means and an input signal, and uses at least the input signal and final delaying means output signal in an operation over the Galois field GF(3).

13. (Amended) A binary-input/ternary-output error correction encoder, characterized in that a generating function generates, with respect to a binary input signal, a ternary output error correction code prescribed by either

$g(D) = 1 + 2D + D^2 + D^4 + D^5 + D^6$

or

$g(D) = 2 + D + 2D^2 + 2D^4 + 2D^5 + 2D^6$.

14. (Amended) The digital communication device according to any of Claims 3, 5 or 6, characterized in that said three-phase modulating means is a binary-input/ternary-output error correction encoder in which a generating function generates, with respect to a binary input signal, a ternary output error correction code prescribed by either

$g(D) = 1 + 2D + D^2 + D^4 + D^5 + D^6$

or

$g(D) = 2 + D + 2D^2 + 2D^4 + 2D^5 + 2D^6$.

15. (Amended) A digital storage device, characterized in comprising:

encoding means for generating, from a binary digital information signal, an error correction code prescribed over a Galois field GF(3); and

three-phase modulating means for changing the phase of a carrier wave in response to a symbol of said error correction code.

16. A digital storage device, characterized in comprising a constant envelope three-phase modulator which comprises:

means for delaying or storing a ternary signal;

response waveform storing means for outputting a quadrature component and an in-phase component corresponding to a transition locus of a carrier wave phase in accordance with patterns of a plurality of temporally consecutive ternary signals; and

means for orthogonally modulating a carrier wave using a quadrature component and an in-phase component outputted from the response waveform storing means.

17. (Amended) A digital storage device, characterized in comprising a binary-input/ternary-output error correction encoder, which comprises an even number of delaying means for

delaying an input signal of a binary digital information signal, and modulo 3 adding means for carrying out an operation over a Galois field GF(3) on a signal outputted from the delaying means and an input signal, and uses at least the input signal and final delaying means output signal in an operation over the Galois field GF(3).

18. (Amended) A digital storage device, characterized in comprising a binary-input/ternary-output error correction encoder in which a generating function generates, with respect to a binary input signal, a ternary output error correction code prescribed by either

$g(D) = 1 + 2D + D^2 + D^4 + D^5 + D^6$

or

$g(D) = 2 + D + 2D^2 + 2D^4 + 2D^5 + 2D^6$.